US 20030021302A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2003/0021302 A1

Grudinin et al. (43) Pub. Date: Jan. 30, 2003

(54) RAMAN CASCADE LIGHT SOURCES

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(21) Appl. No.: 10/193,149

(22) Filed: Jul. 12, 2002

Related U.S. Application Data

(60) Provisional application No. 60/306,406, filed on Jul. 20, 2001.

(30) Foreign Application Priority Data

Jul. 18, 2001 (EP) 01306189.0

Publication Classification

(51) Int. Cl.[7] H01S 3/30; H01S 3/091; H01S 3/092; H01S 3/08; H01S 3/083

(52) U.S. Cl. 372/6; 372/70; 372/3; 372/92; 372/94

(57) ABSTRACT

A Raman cascade laser comprising a 1060 nm pump source, an input waveguide and a ring waveguide coupled to the input waveguide. The ring waveguide is at least in part formed of phosphosilicate fiber so as to Raman scatter the pump beam from the pump wavelength to a gain wavelength that is offset from the pump wavelength by a first Raman step of 1330 cm^{-1}. Light is coupled out with an output waveguide coupled to the ring waveguide at an emission wavelength offset by a second Raman step of 1330 cm^{-1} from the gain wavelength. Other embodiments provide incoherent sources based on the same 2-step Raman cascade, or a 2-step Raman cascade based on a first phosphosilicate 1330 cm^{-1} Raman step followed by a second step of 680-820 cm^{-1}. With the invention, it is possible to avoid a Raman cascade involving a larger number of steps while at the same time avoiding use of 1300 nm pump sources. Moreover, the need for high-reflectivity fiber Bragg gratings at the gain wavelength, and also the emission wavelength, can be reduced through wavelength selection provided by the coupling to the ring waveguide.